

**Solid Waste Management in NC
Carolina Recycling Association**

March 27 2008

Ellen Lorscheider, Programs Manager
Solid Waste Section
Division of Waste Management
Department of Environment and Natural Resources

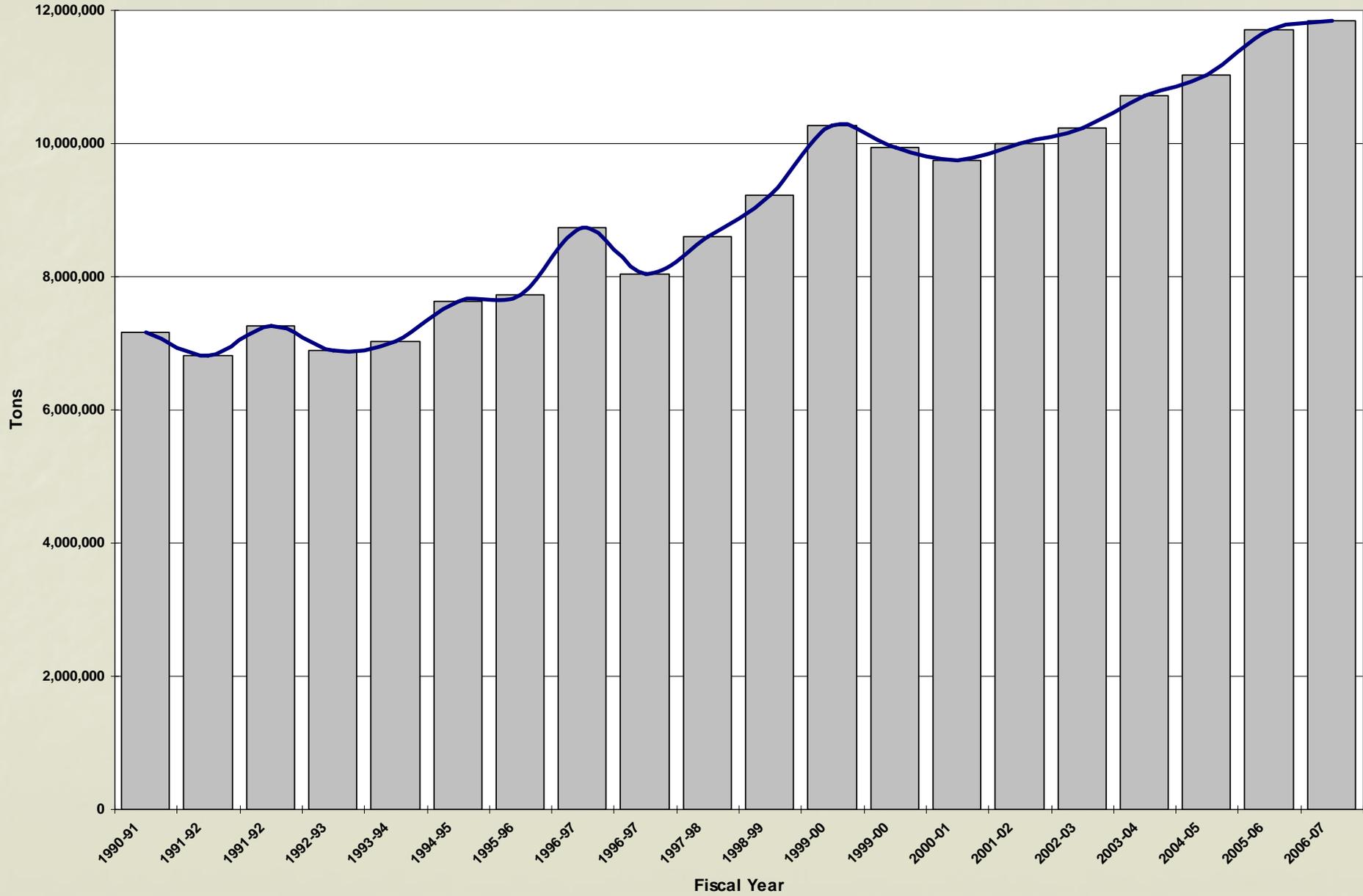


Solid Waste in North Carolina The Future:

We have a lot of Waste to Manage

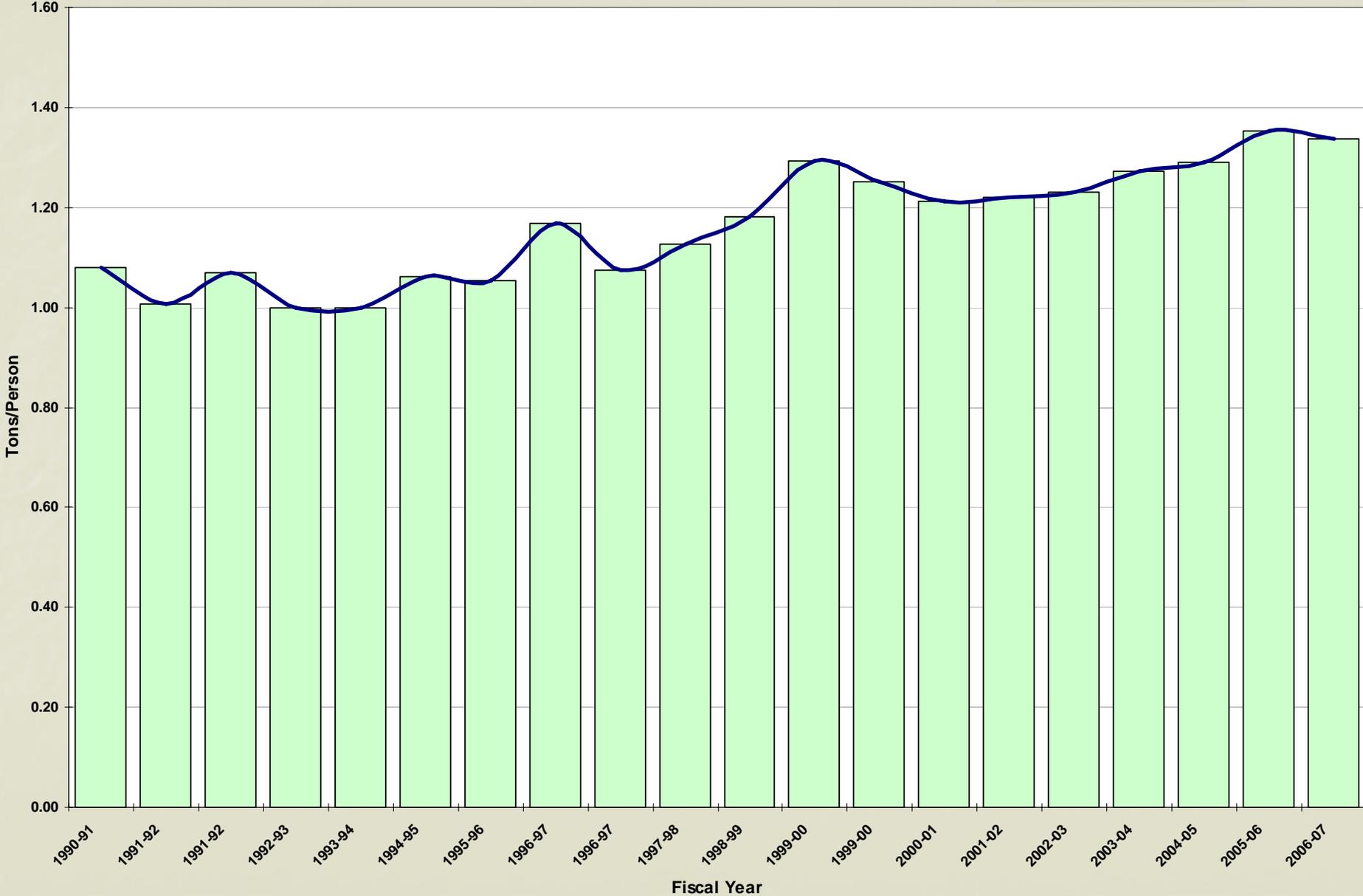
Tons of Solid Waste Disposed of by North Carolina

Division of
Waste
Management



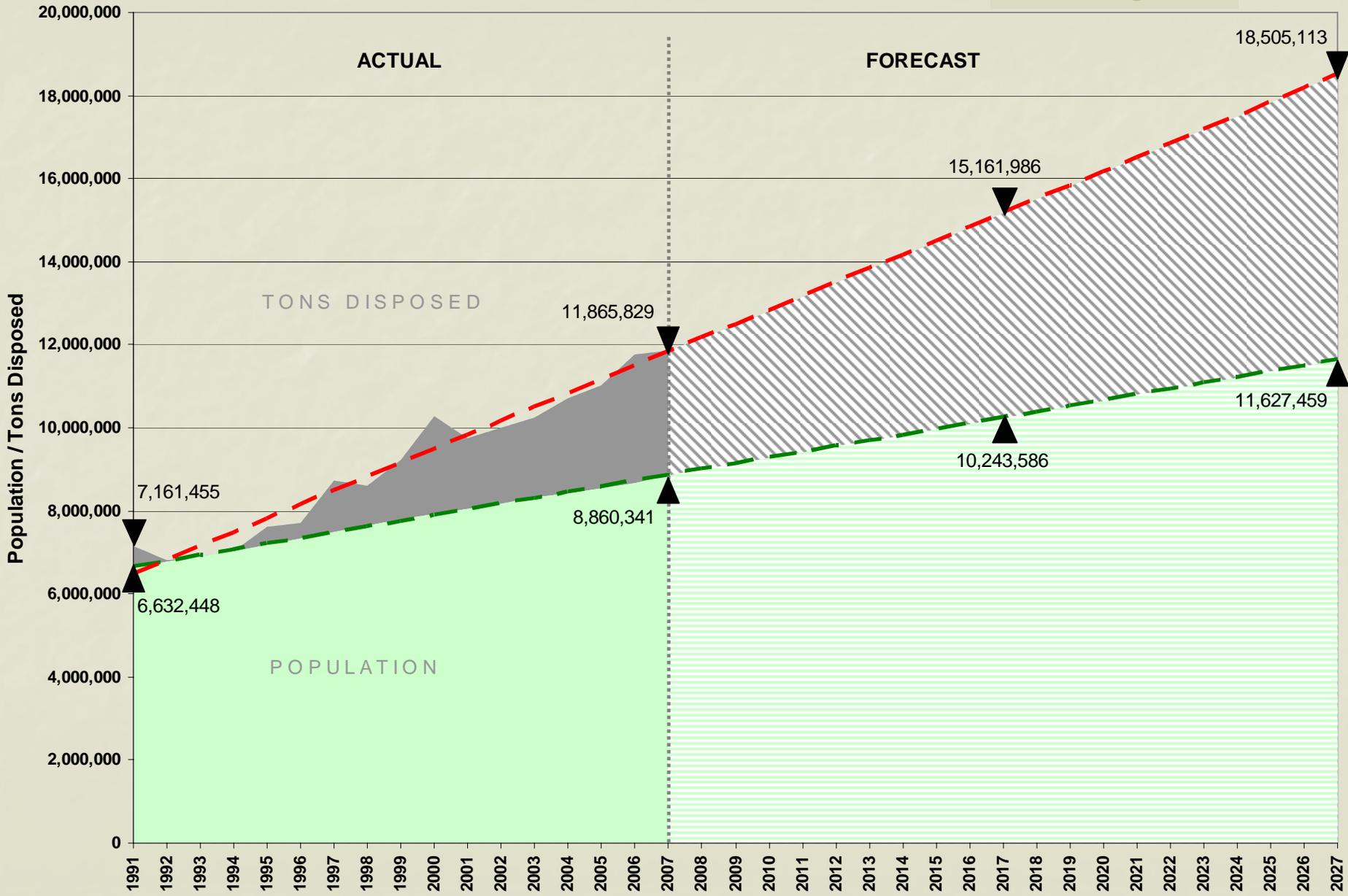
NC Per Capita Waste Disposal

Division of
Waste
Management



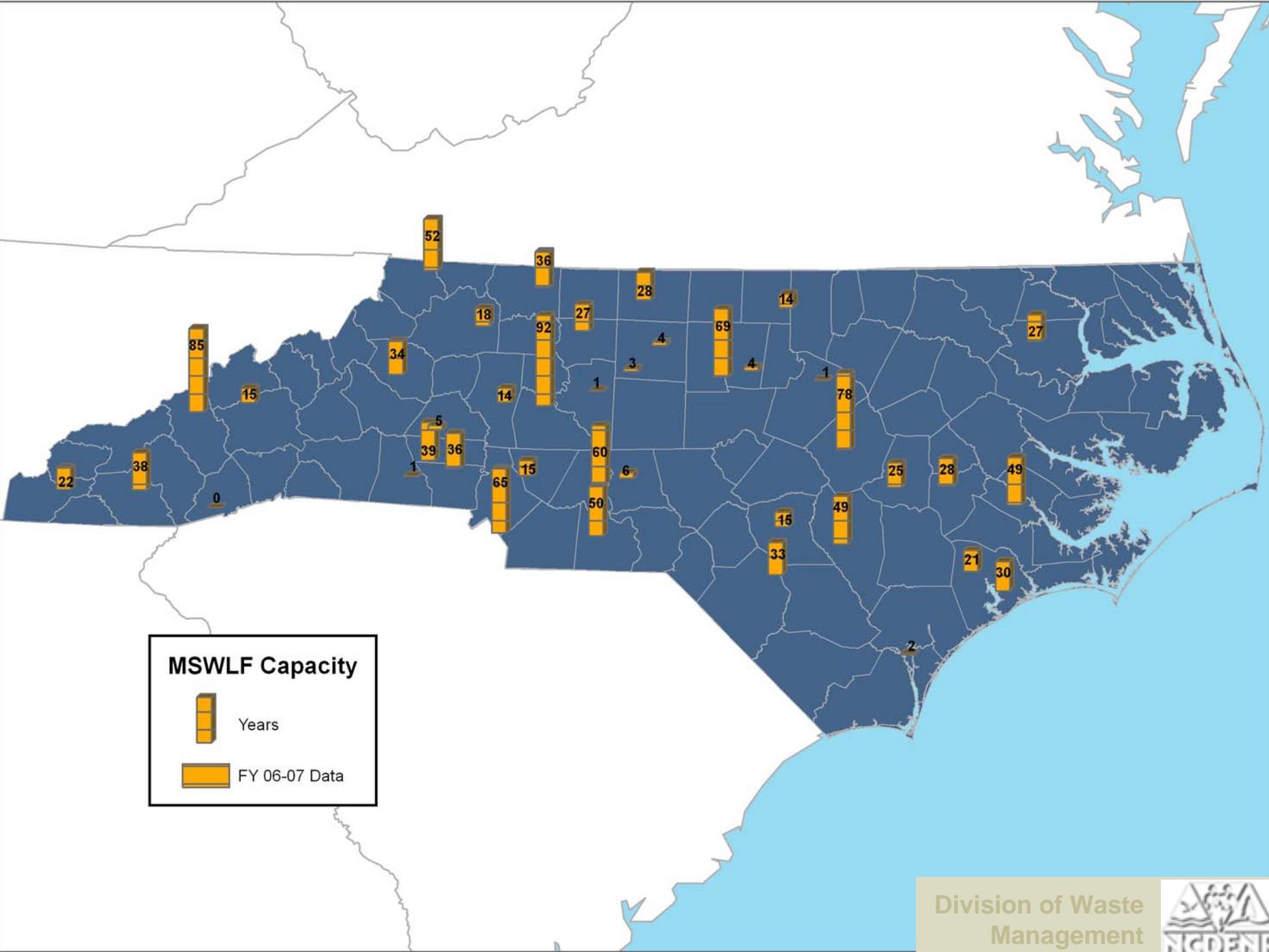
North Carolina Solid Waste Disposal 20-Year Forecast

Division of
Waste
Management



Municipal Solid Waste Landfill





MSWLF Capacity (cubic yards)

FY 2006-2007



Volume Used

Volume Remaining

State-wide Municipal Solid Waste Landfills (MSWLF)

FY 2006-2007

40 MSW Landfills currently operating
 Average facility size: 310.8 acres
 Average waste footprint: 76.5 acres
 Average compaction density: 0.60 tons/cy
 Average years in operation: 11.1 years

	<u>Average</u>	<u>FY2006-2007</u>	<u>Total</u>
<u>MSW Disposed (tons)</u>	7,504,023.01	8,041,765.83	83,294,655.46
	<u>Used</u>	<u>Constructed</u>	<u>Overall</u>
<u>Volume (yd³)</u>	120,867,902.3	149,872,127	385,942,182
Remaining Volume		29,004,224.7	265,074,279.7
<u>Remaining Capacity</u>			
Tons of Waste		17,279,574.66	157,920,815.11
Years (average)		2.30	21.04
Years (FY06-07)		2.15	19.64

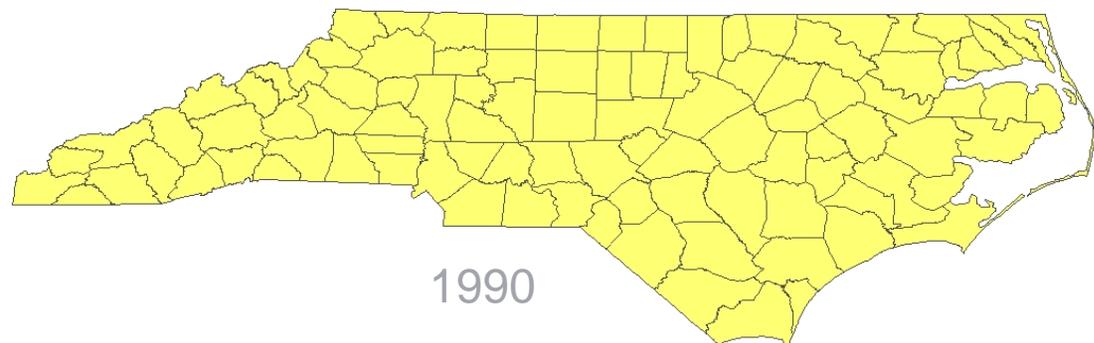
Table #1: LANDFILL GAS-TO-ENERGY PROJECTS IN NORTH CAROLINA

Facility	County	Energy Type/End Use
BFI-Charlotte Motor Speedway MSW	Cabarrus	Electricity
Buncombe Co MSW	Buncombe	Steam
Catawba Co. MSWLF	Catawba	Electricity
City of Greensboro MSW	Guilford	Steam
City of Raleigh MSW	Wake	Steam
City of Winston-Salem MSW	Forsyth	Electricity
Coastal Area Solid Waste Mgmt Authority MSW	Craven	Electricity
Cumberland Co. MSW	Cumberland	Steam
Henderson Co. MSW	Henderson	Steam
Iredell Co. MSW	Iredell	Electricity
Jackson County MSW Green Energy Park	Jackson	Art Center/Blacksmith
North Wake MSW	Wake	Steam
Pitt Co. MSW	Pitt	Steam
Yancey/Mitchell Co. MSW	Yancey	Greenhouse/Art Center

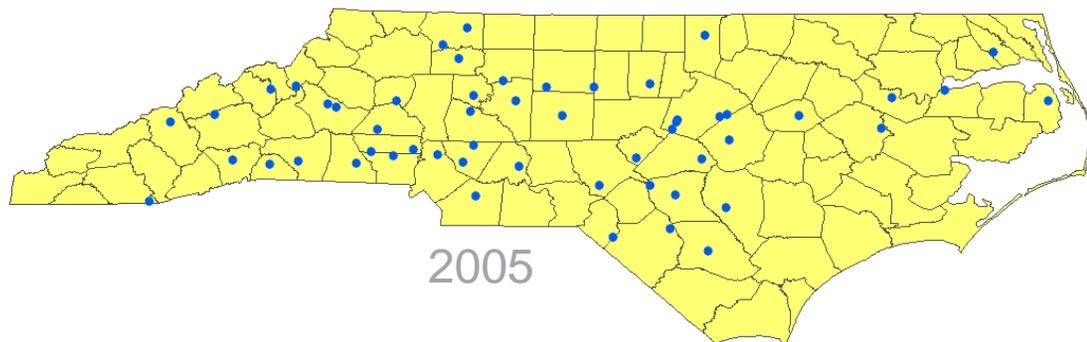
C&D landfills



Construction & Demolition Landfills in North Carolina 1990 and 2005

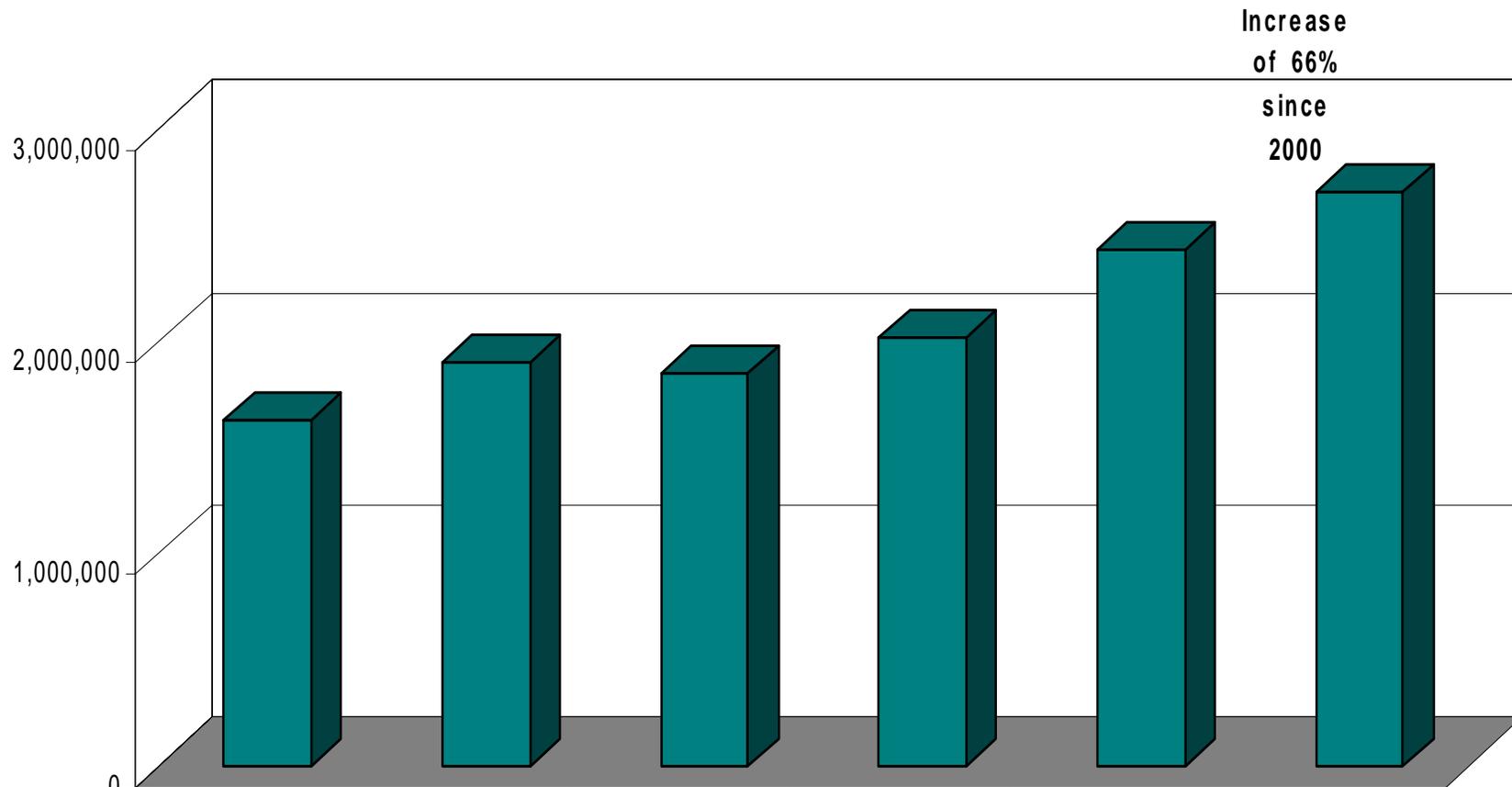


1990



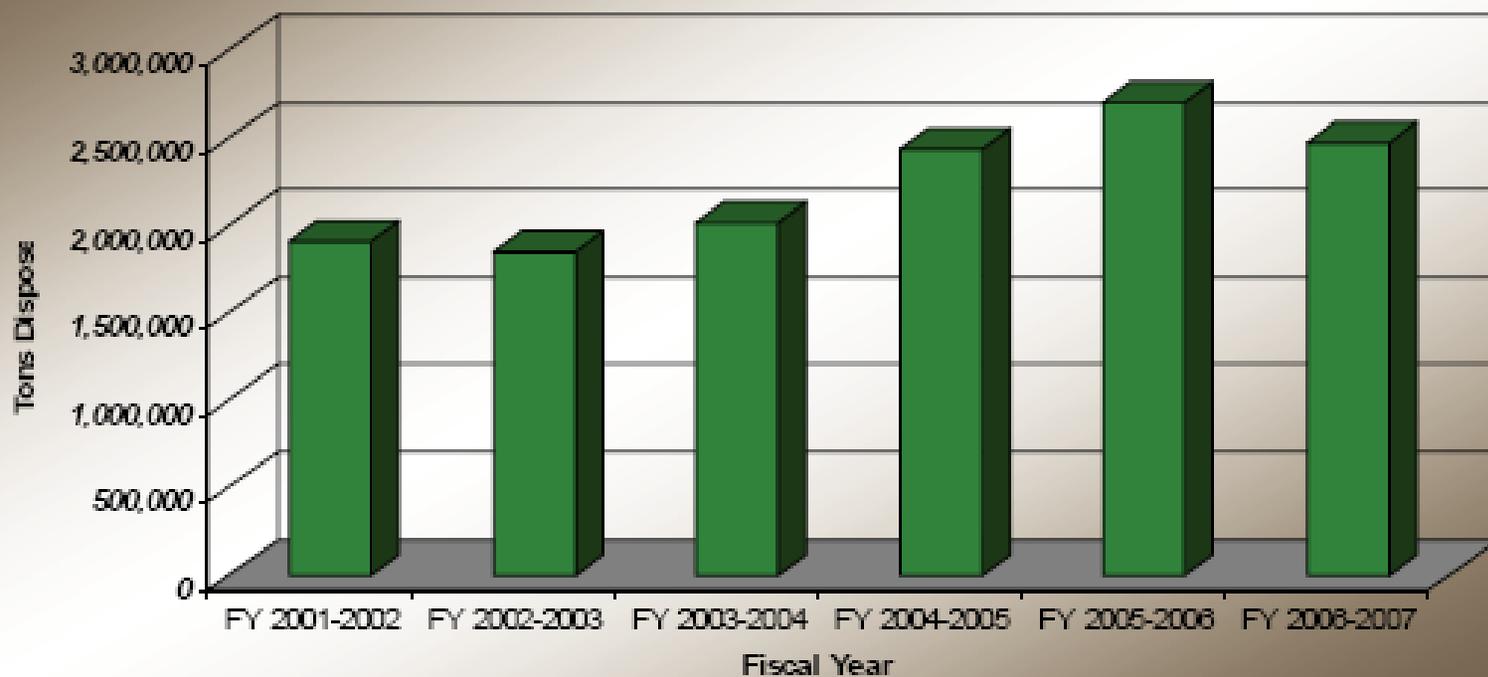
2005

Construction and Demolition Waste Disposal in North Carolina FY 2000-2001 to FY 2005-2006

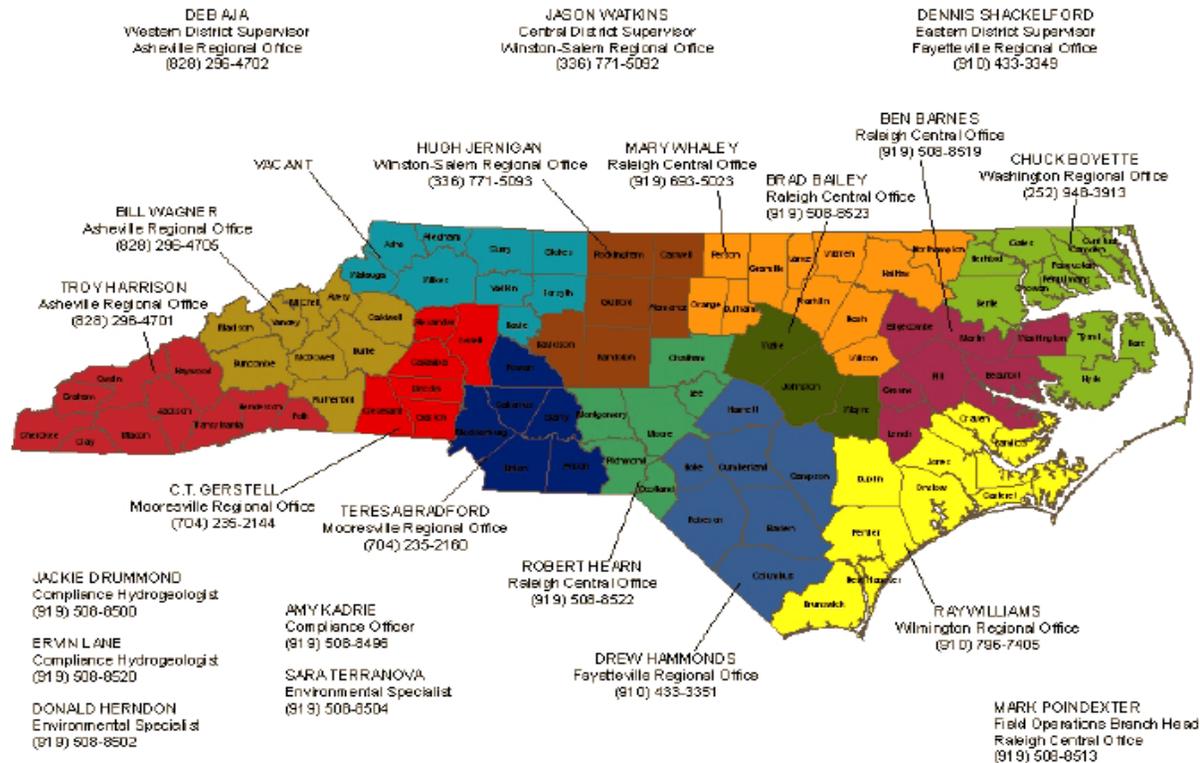


	FY 2000-2001	FY 2001-2002	FY 2002-2003	FY 2003-2004	FY 2004-2005	FY 2005-2006
■ Total C&D	1,627,600	1,906,084	1,844,409	2,020,529	2,436,442	2,707,592

Construction and Demolition Disposal FY 2001-2002 to 2006-2007



NC DENR - DWM
Solid Waste Section - Field Operations Branch



TRANSFER STATIONS









Division of Waste
Management



Transfer Station Growth in North Carolina from 1990-2005



▲ Transfer Station



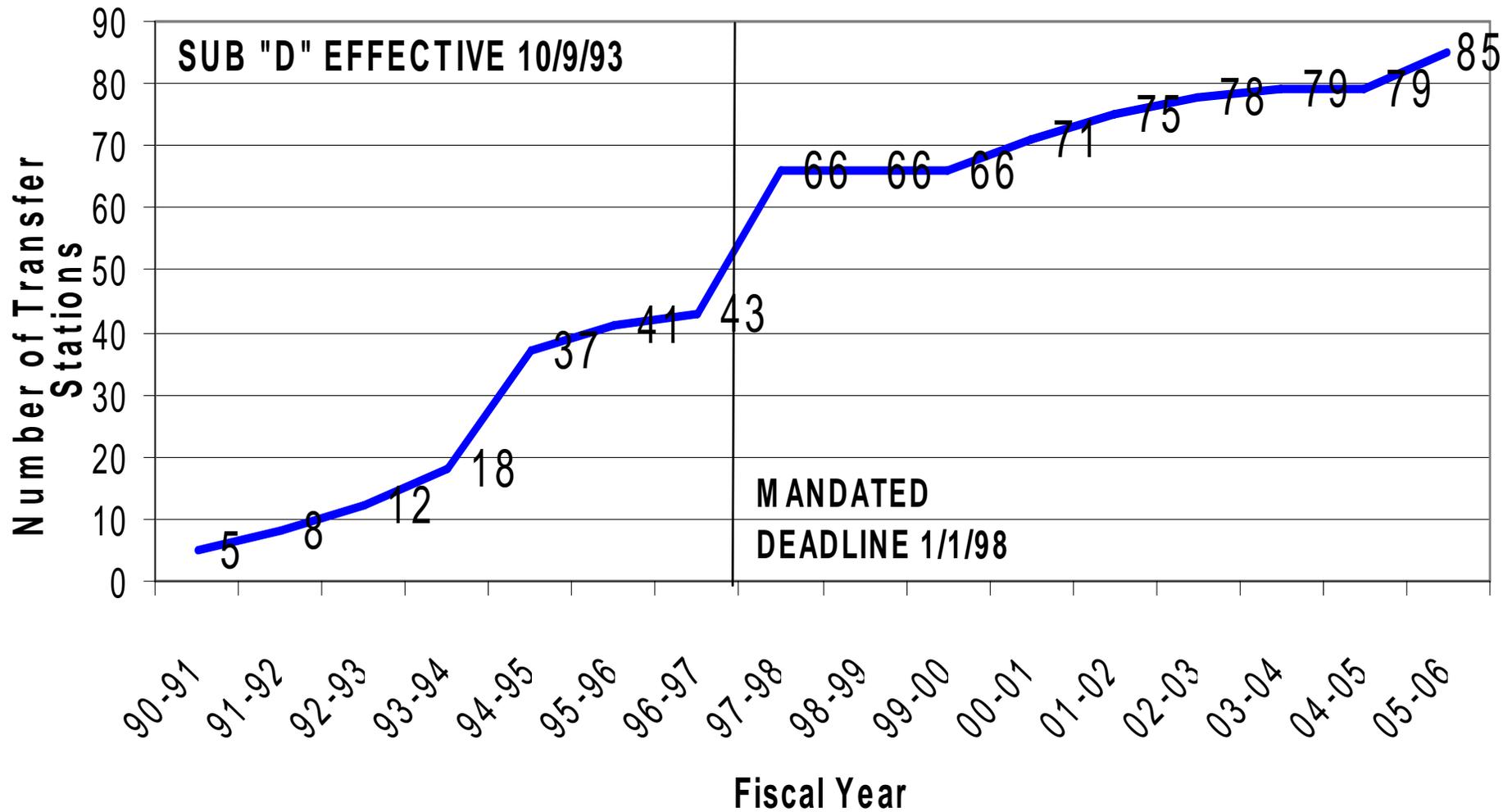
Created - 1-08-07

Data - North Carolina Division of Solid Waste Database

Map by - Garrett Davis and Environmental Finance Center - UNC Chapel Hill

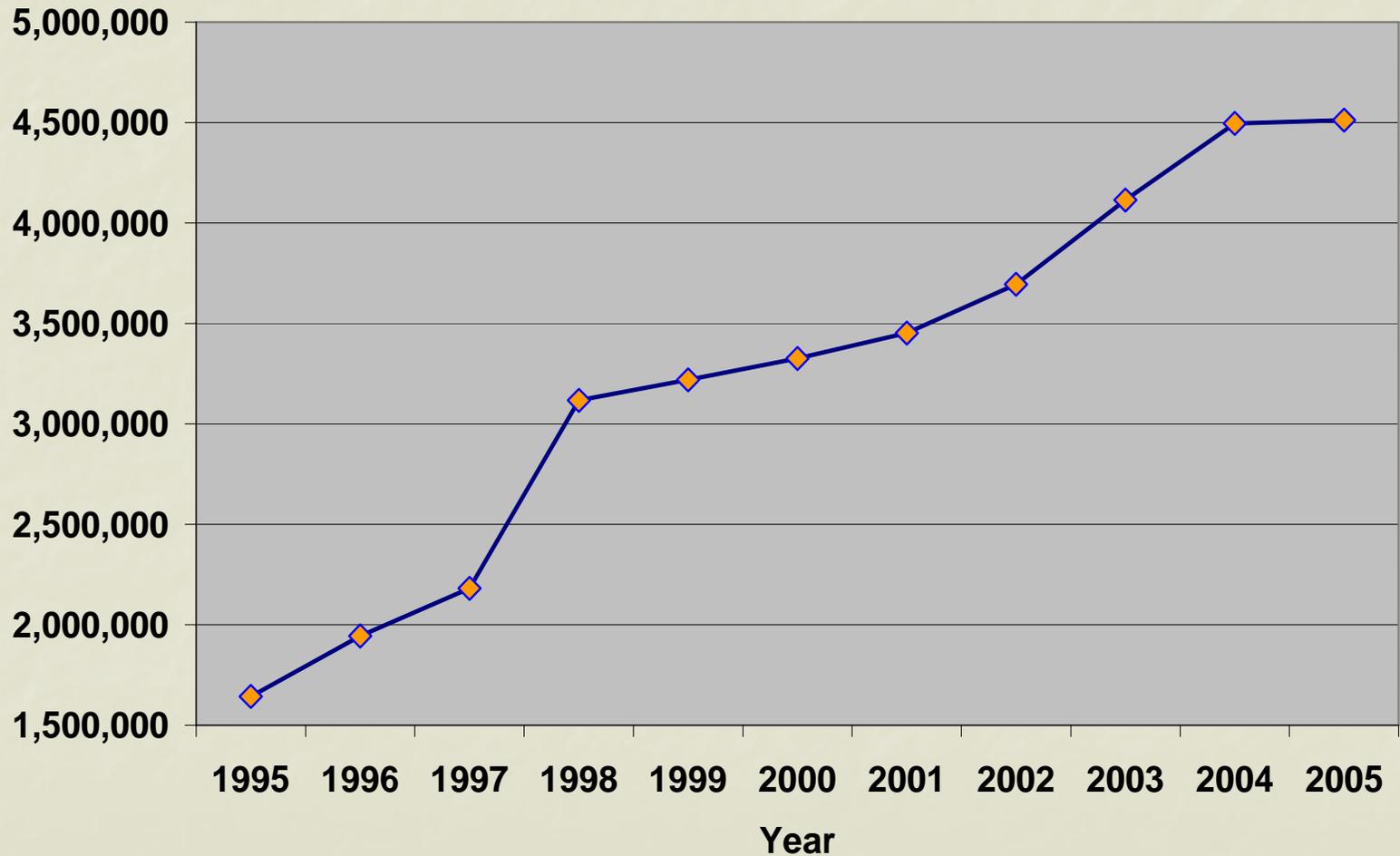
Funding by - NCDENR

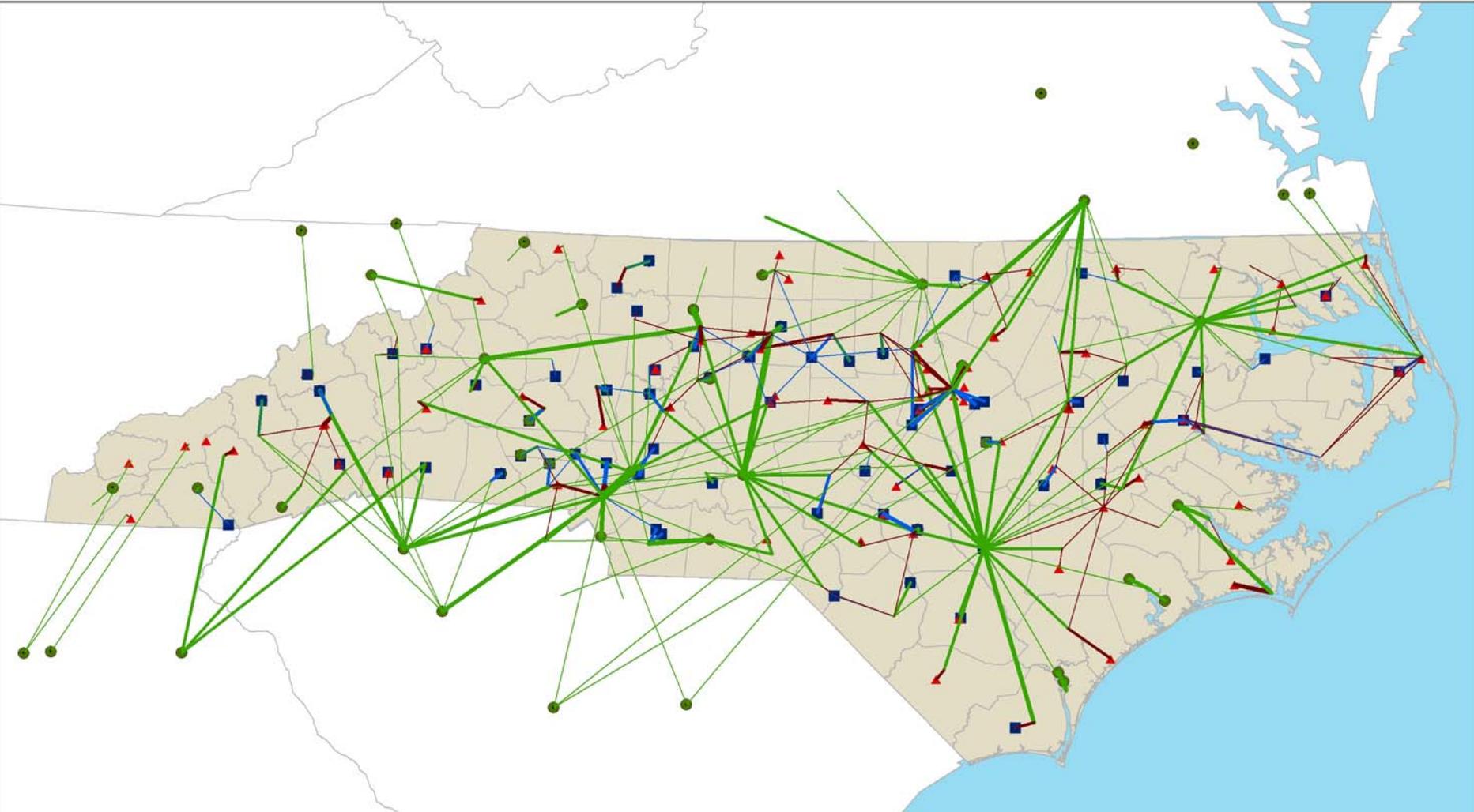
Active Transfer Stations



Transfer Stations

Annual Tons Received at Facilities





FY 06-07 Waste Flow (tons)

Waste Types

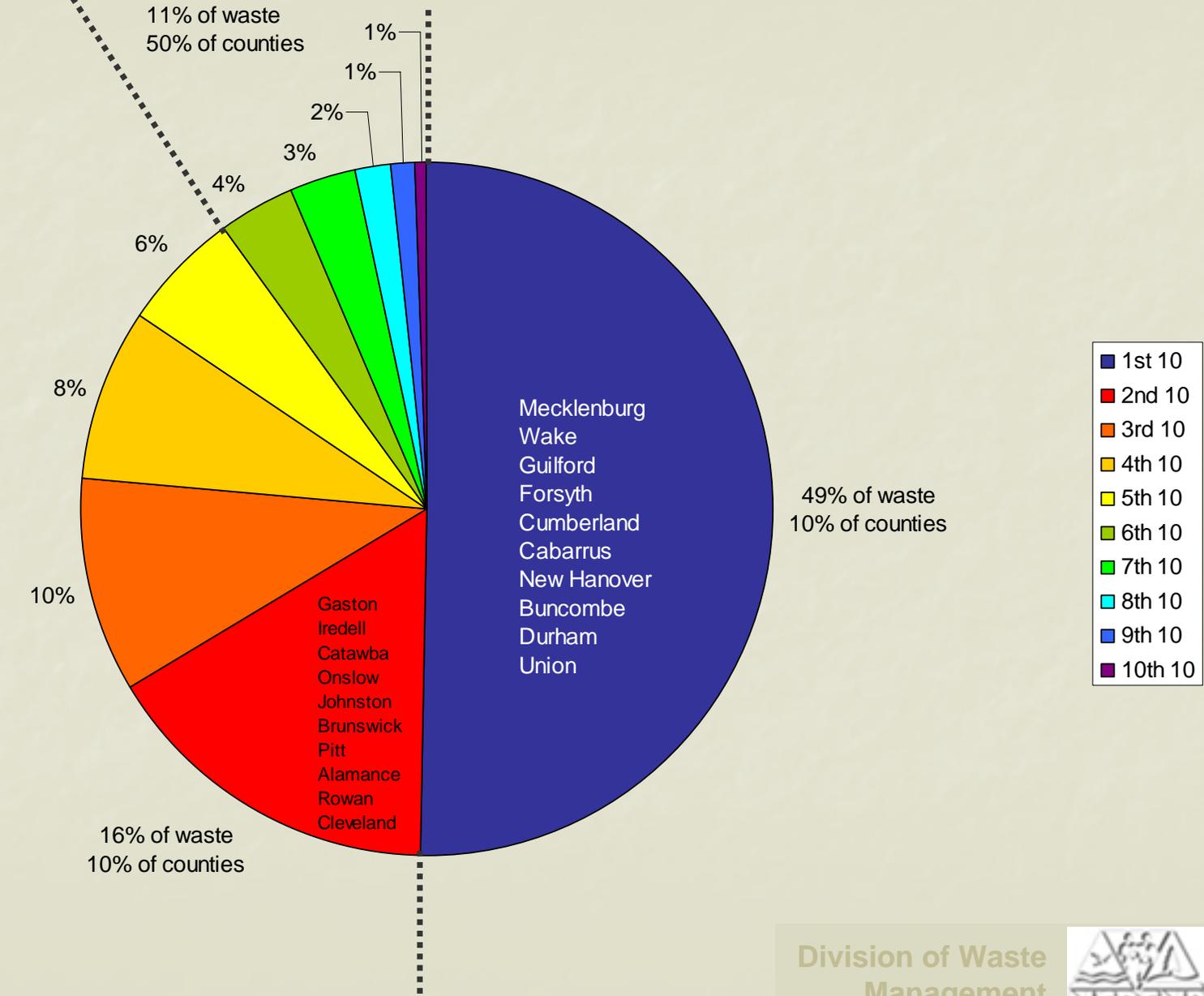
CDLF	MSWLF	Transfer
500.64 - 25,000.00	500.64 - 25,000.00	500.64 - 25,000.00
25,000.01 - 100,000.00	25,000.01 - 100,000.00	25,000.01 - 100,000.00
100,000.01 - 200,000.00	100,000.01 - 200,000.00	100,000.01 - 200,000.00
200,000.01 - 400,000.00	200,000.01 - 400,000.00	200,000.01 - 400,000.00
400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00

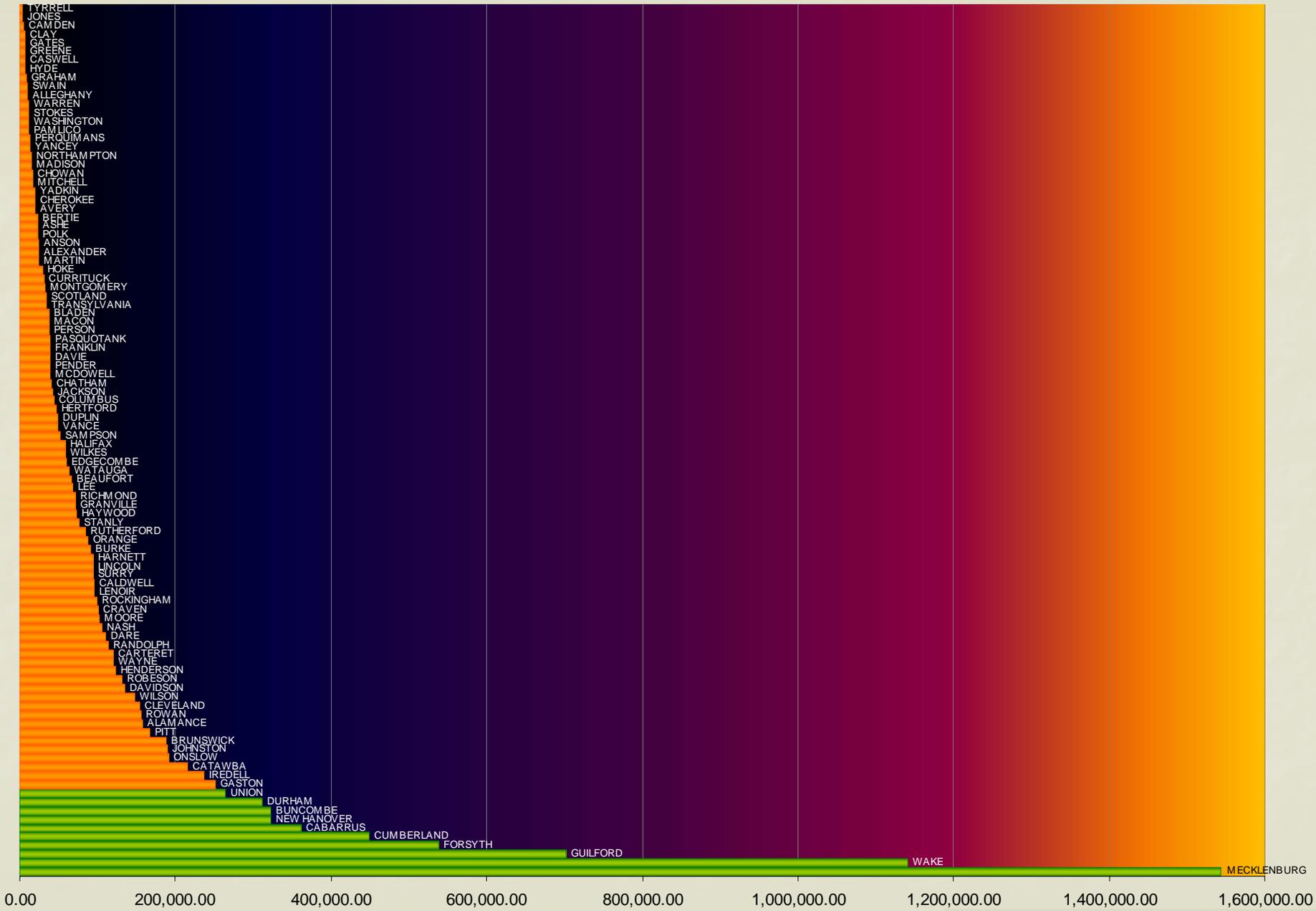
Facilities

- CDLF (Blue Square)
- MSWLF (Green Circle)
- TRANSFER (Red Triangle)

Tons Disposed FY 2006-2007

Counties in Groups of Ten

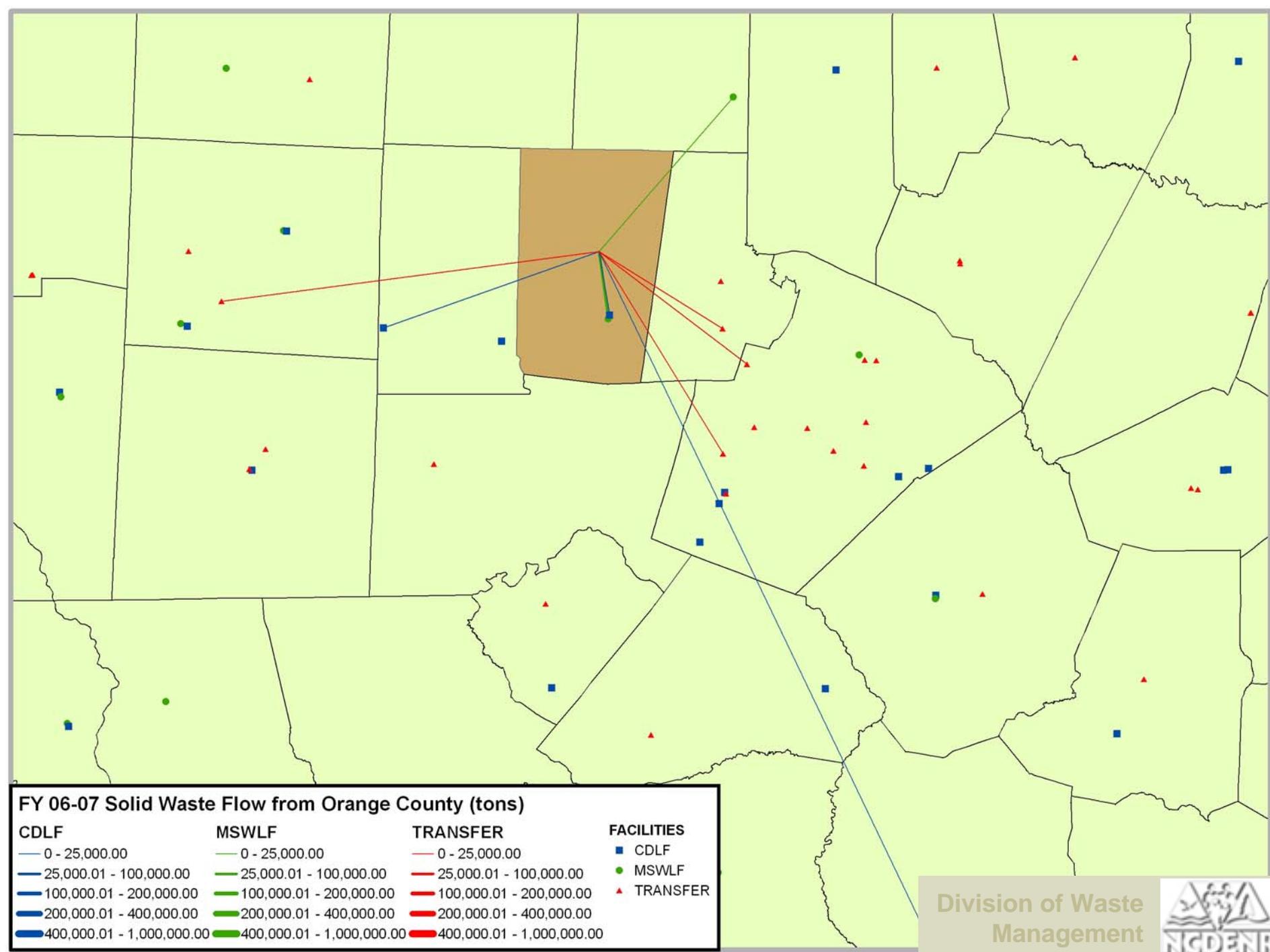




FY06-07 Tons Disposed

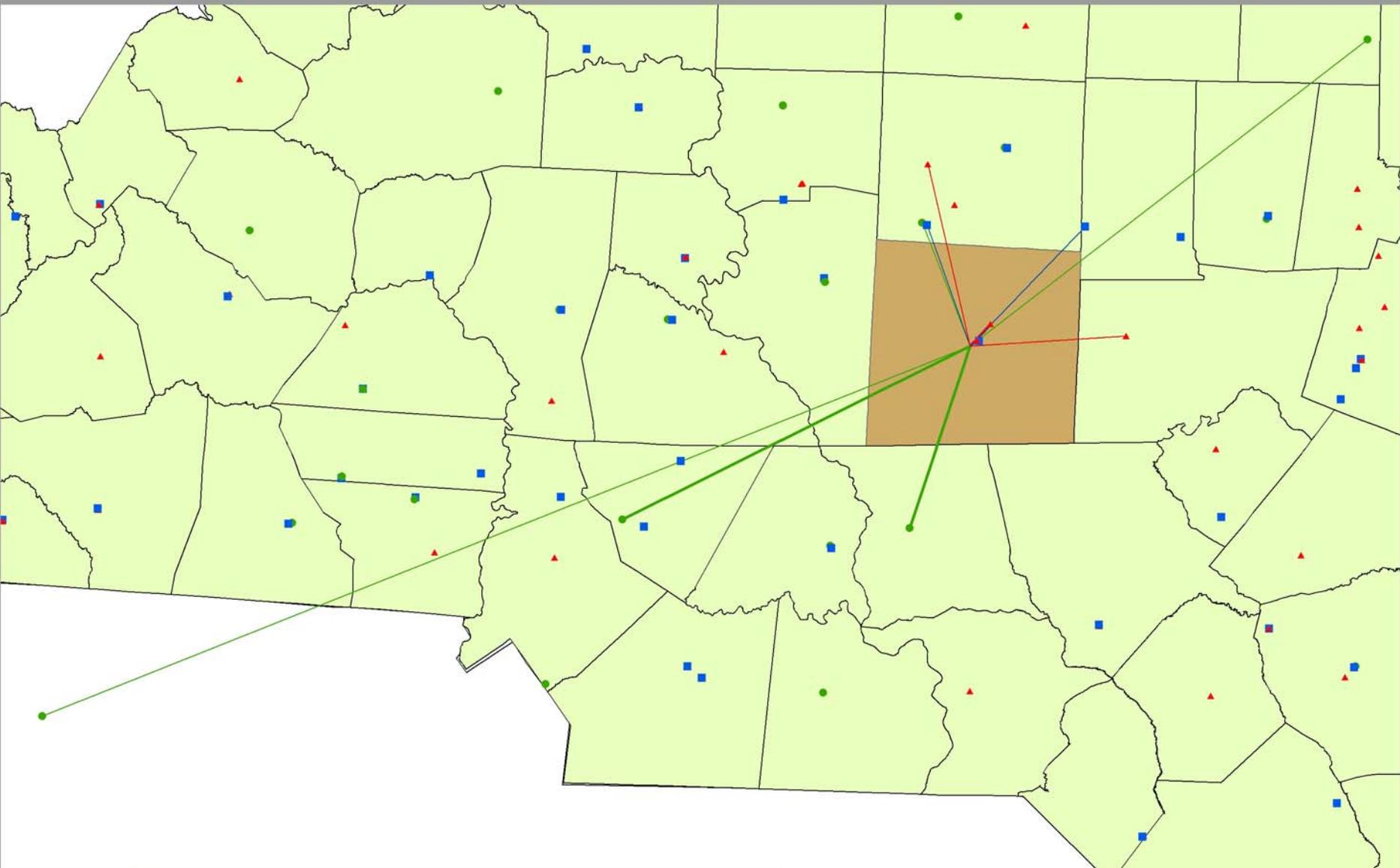
Division of Waste Management





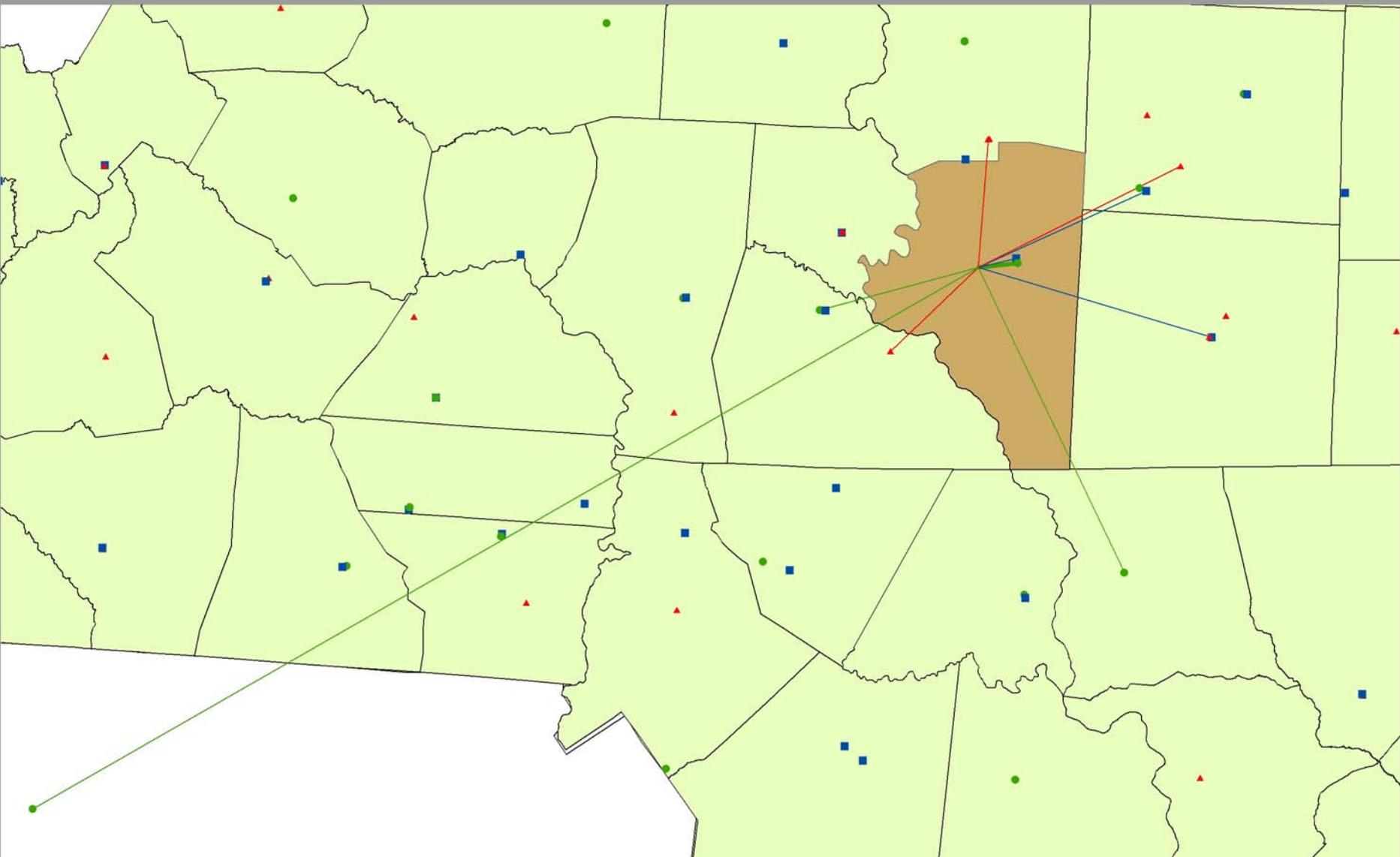
FY 06-07 Solid Waste Flow from Orange County (tons)

CDLF	MSWLF	TRANSFER	FACILITIES
— 0 - 25,000.00	— 0 - 25,000.00	— 0 - 25,000.00	■ CDLF
— 25,000.01 - 100,000.00	— 25,000.01 - 100,000.00	— 25,000.01 - 100,000.00	● MSWLF
— 100,000.01 - 200,000.00	— 100,000.01 - 200,000.00	— 100,000.01 - 200,000.00	▲ TRANSFER
— 200,000.01 - 400,000.00	— 200,000.01 - 400,000.00	— 200,000.01 - 400,000.00	
— 400,000.01 - 1,000,000.00	— 400,000.01 - 1,000,000.00	— 400,000.01 - 1,000,000.00	



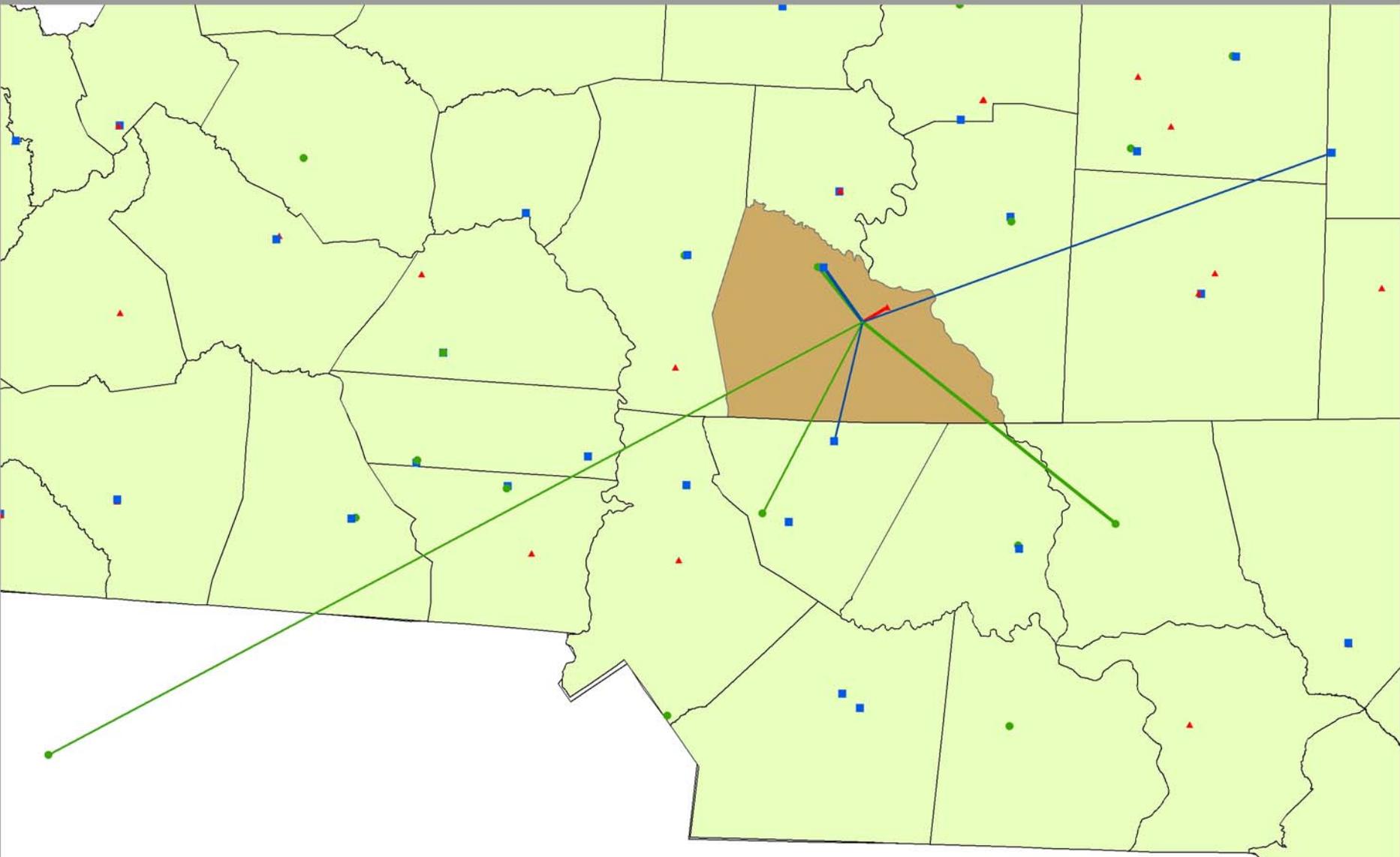
FY 06-07 Solid Waste Flow from Randolph County (tons)

CDLF	MSWLF	TRANSFER	FACILITIES
0 - 25,000.00	0 - 25,000.00	0 - 25,000.00	CDLF
25,000.01 - 100,000.00	25,000.01 - 100,000.00	25,000.01 - 100,000.00	MSWLF
100,000.01 - 200,000.00	100,000.01 - 200,000.00	100,000.01 - 200,000.00	TRANSFER
200,000.01 - 400,000.00	200,000.01 - 400,000.00	200,000.01 - 400,000.00	
400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	



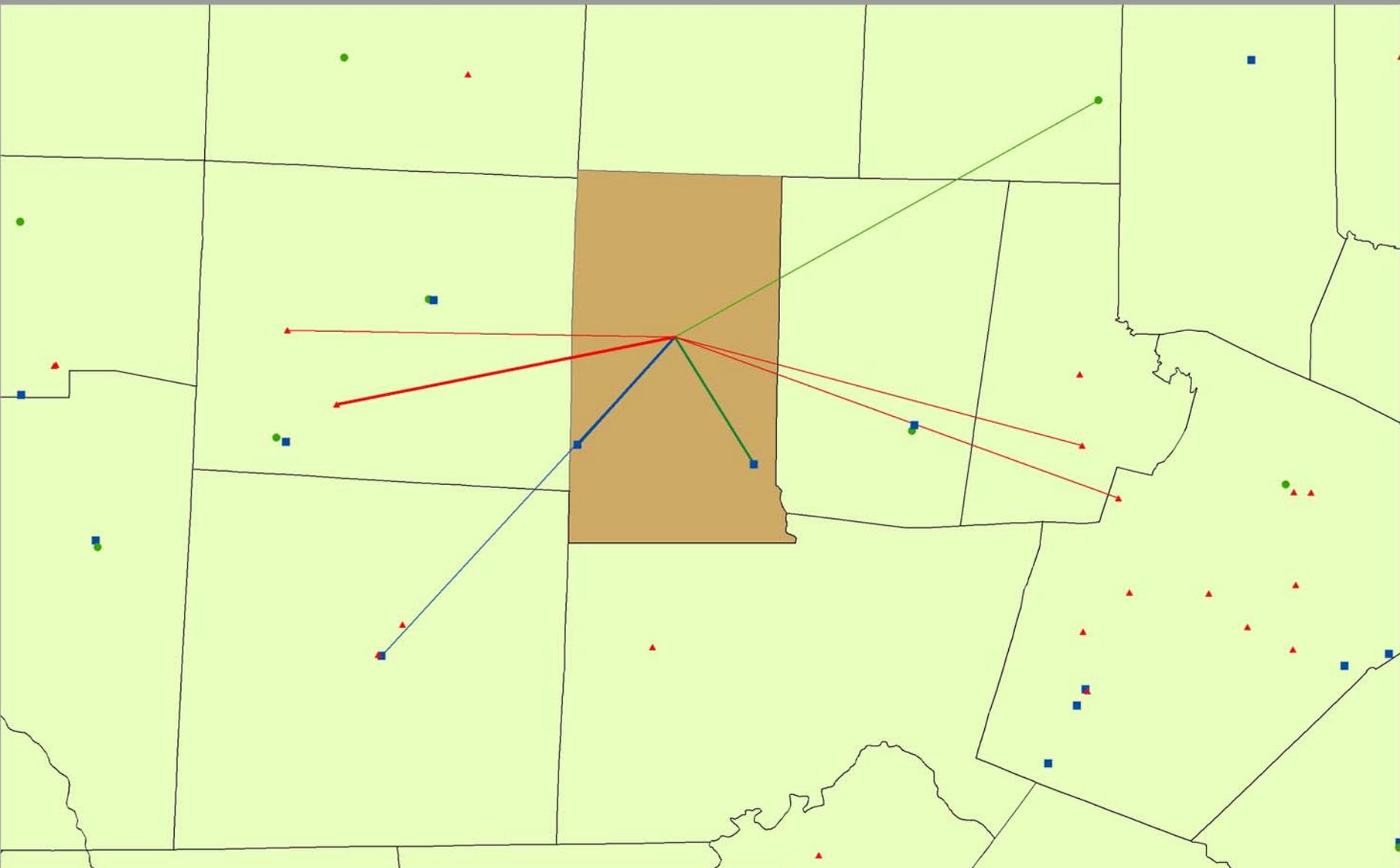
FY 06-07 Solid Waste Flow from Davidson County (tons)

CDLF	MSWLF	TRANSFER	FACILITIES
0 - 25,000.00	0 - 25,000.00	0 - 25,000.00	■ CDLF
25,000.01 - 100,000.00	25,000.01 - 100,000.00	25,000.01 - 100,000.00	● MSWLF
100,000.01 - 200,000.00	100,000.01 - 200,000.00	100,000.01 - 200,000.00	▲ TRANSFER
200,000.01 - 400,000.00	200,000.01 - 400,000.00	200,000.01 - 400,000.00	
400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	



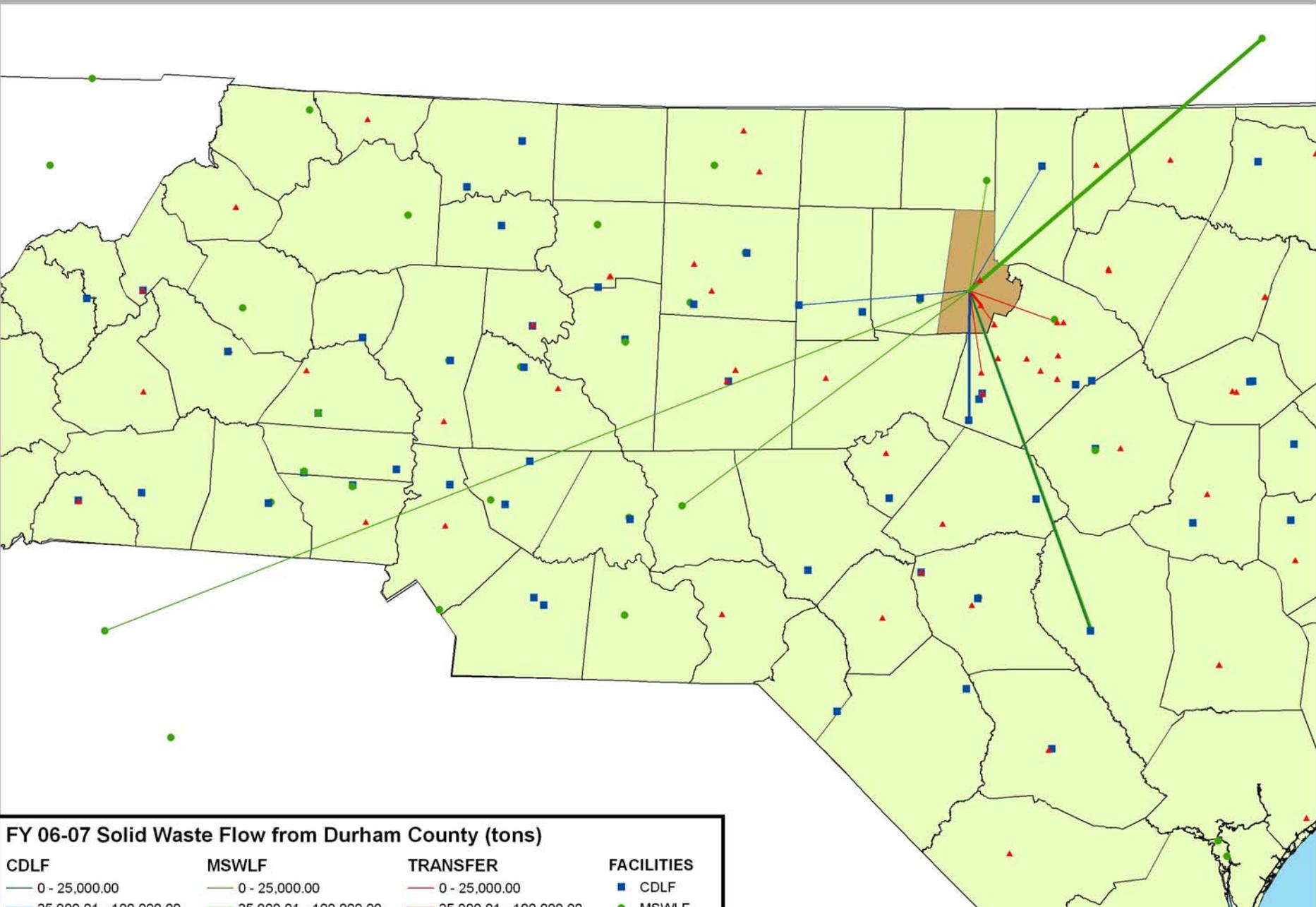
FY 06-07 Solid Waste Flow from Rowan County (tons)

CDLF	MSWLF	TRANSFER	FACILITIES
0 - 25,000.00	0 - 25,000.00	0 - 25,000.00	CDLF
25,000.01 - 100,000.00	25,000.01 - 100,000.00	25,000.01 - 100,000.00	MSWLF
100,000.01 - 200,000.00	100,000.01 - 200,000.00	100,000.01 - 200,000.00	TRANSFER
200,000.01 - 400,000.00	200,000.01 - 400,000.00	200,000.01 - 400,000.00	
400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	



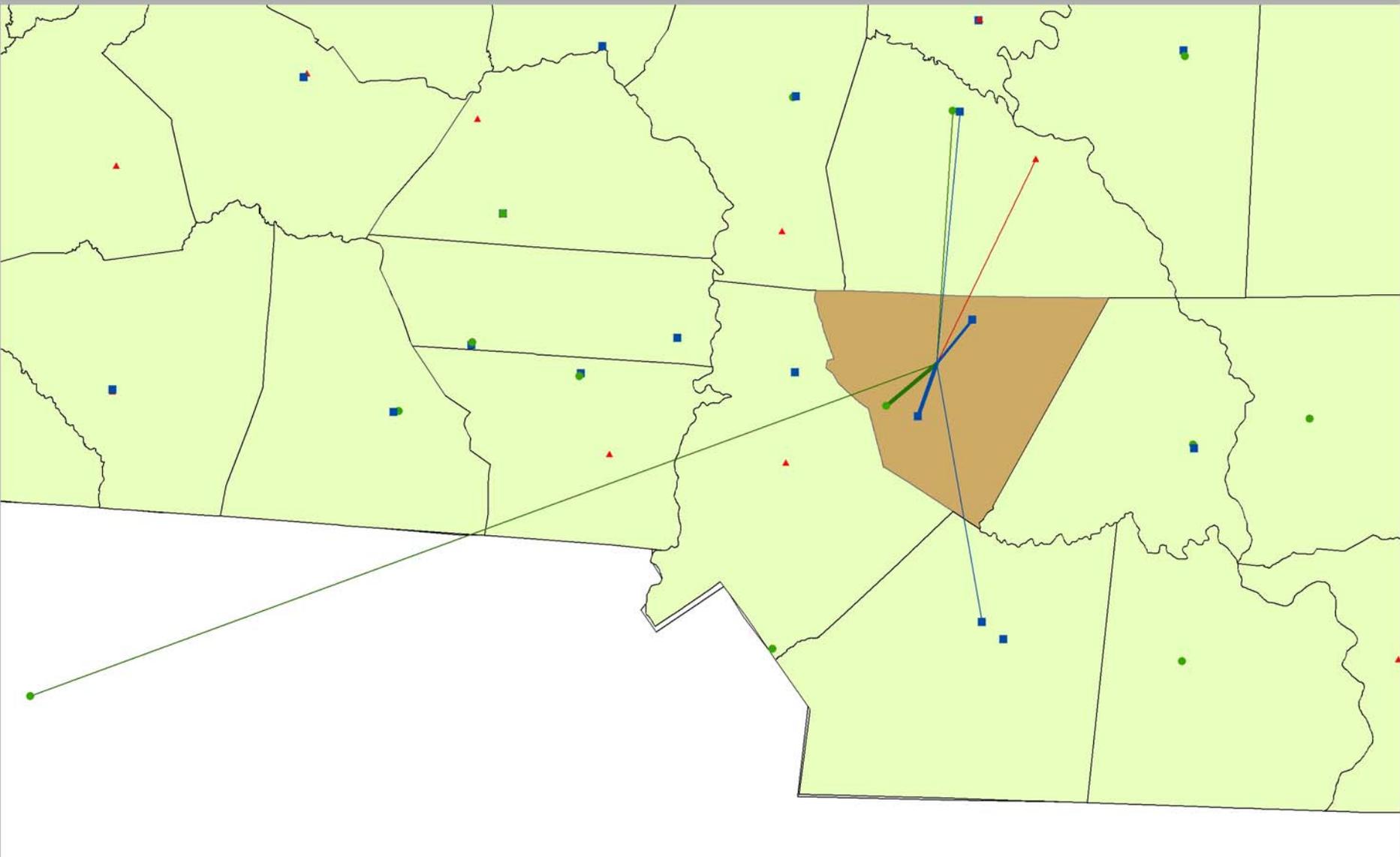
FY 06-07 Solid Waste Flow for Alamance County (tons)

CDLF	MSWLF	TRANSFER	FACILITIES
0 - 25,000.00	0 - 25,000.00	0 - 25,000.00	■ CDLF
25,000.01 - 100,000.00	25,000.01 - 100,000.00	25,000.01 - 100,000.00	● MSWLF
100,000.01 - 200,000.00	100,000.01 - 200,000.00	100,000.01 - 200,000.00	▲ TRANSFER
200,000.01 - 400,000.00	200,000.01 - 400,000.00	200,000.01 - 400,000.00	
400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	



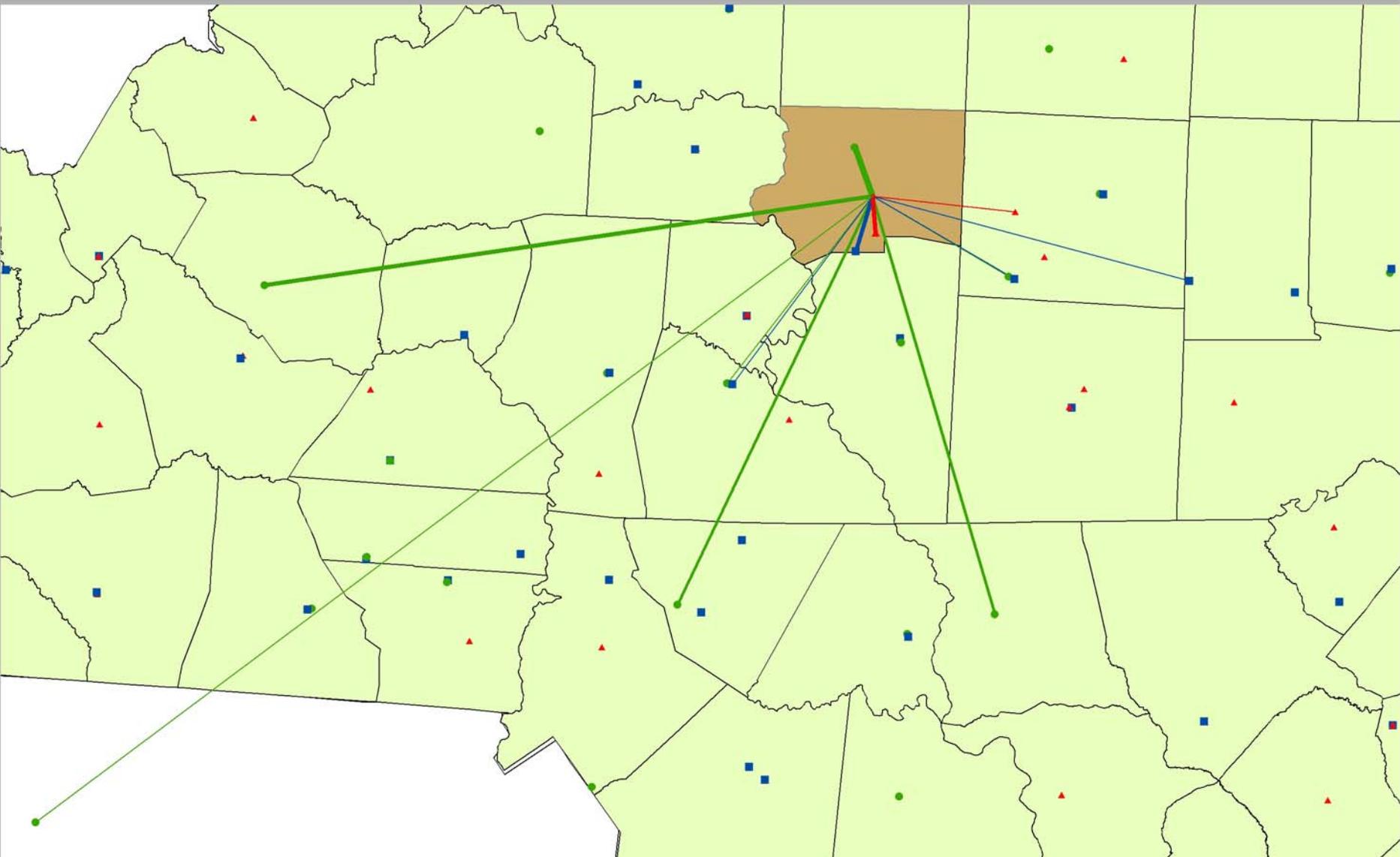
FY 06-07 Solid Waste Flow from Durham County (tons)

CDLF	MSWLF	TRANSFER	FACILITIES
0 - 25,000.00	0 - 25,000.00	0 - 25,000.00	■ CDLF
25,000.01 - 100,000.00	25,000.01 - 100,000.00	25,000.01 - 100,000.00	● MSWLF
100,000.01 - 200,000.00	100,000.01 - 200,000.00	100,000.01 - 200,000.00	▲ TRANSFER
200,000.01 - 400,000.00	200,000.01 - 400,000.00	200,000.01 - 400,000.00	
400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	



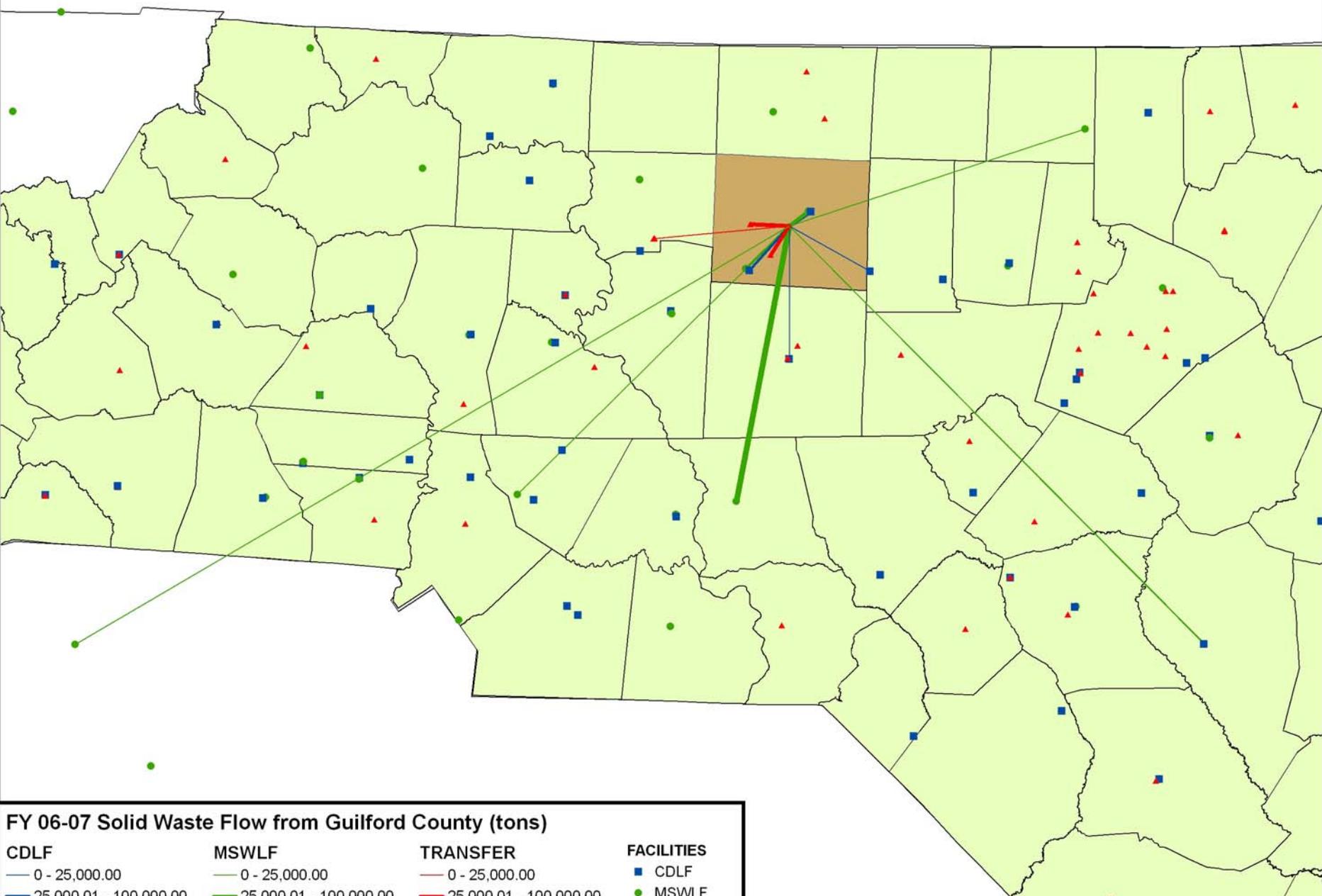
FY 06-07 Solid Waste Flow from Cabarrus County (tons)

CDLF	MSWLF	TRANSFER	FACILITIES
0 - 25,000.00	0 - 25,000.00	0 - 25,000.00	■ CDLF
25,000.01 - 100,000.00	25,000.01 - 100,000.00	25,000.01 - 100,000.00	● MSWLF
100,000.01 - 200,000.00	100,000.01 - 200,000.00	100,000.01 - 200,000.00	▲ TRANSFER
200,000.01 - 400,000.00	200,000.01 - 400,000.00	200,000.01 - 400,000.00	
400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	



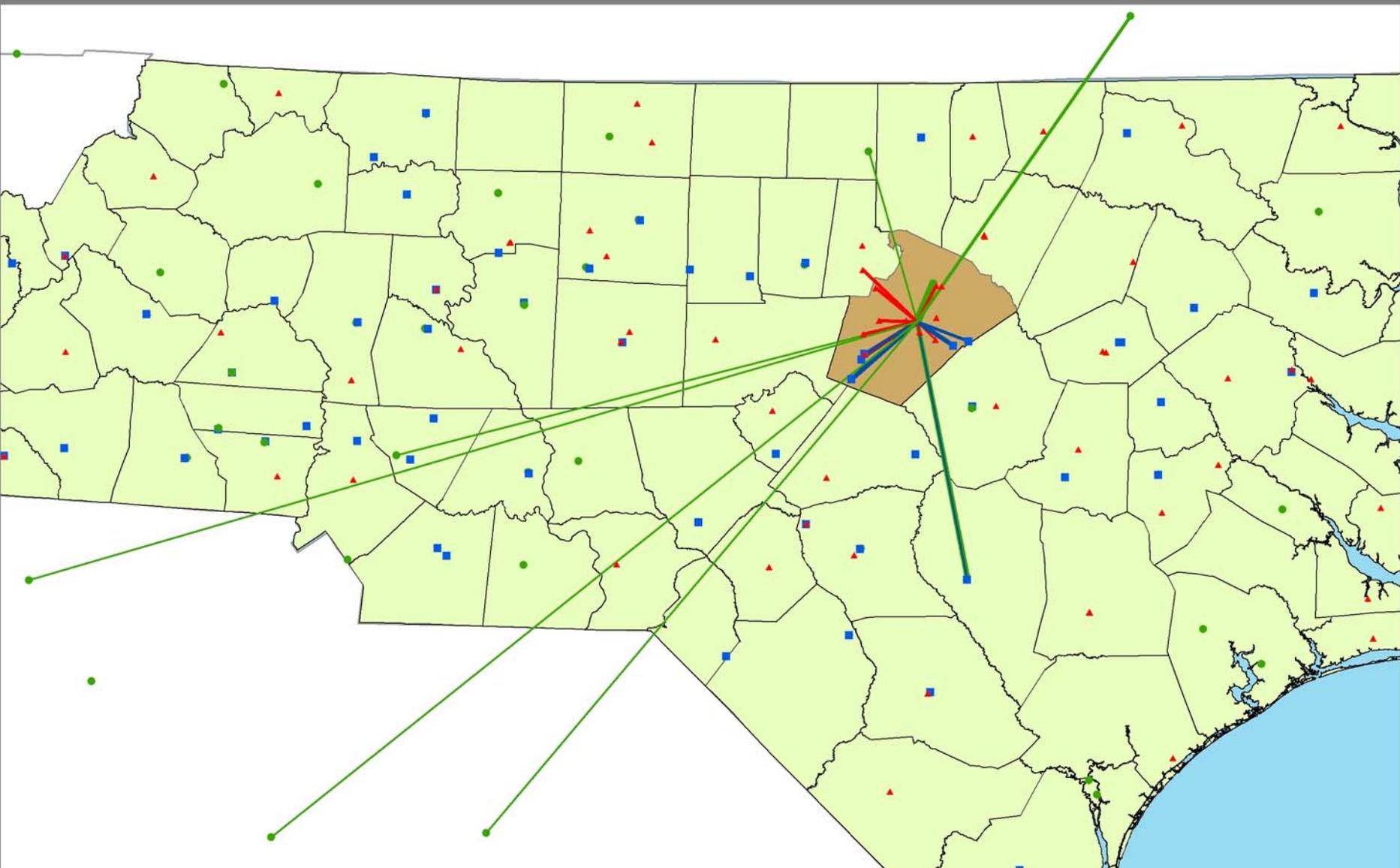
FY 06-07 Solid Waste Flow from Forsyth County (tons)

CDLF	MSWLF	TRANSFER	FACILITY TYPES
— 0 - 25,000.00	— 0 - 25,000.00	— 0 - 25,000.00	■ CDLF
— 25,000.01 - 100,000.00	— 25,000.01 - 100,000.00	— 25,000.01 - 100,000.00	● MSWLF
— 100,000.01 - 200,000.00	— 100,000.01 - 200,000.00	— 100,000.01 - 200,000.00	▲ TRANSFER
— 200,000.01 - 400,000.00	— 200,000.01 - 400,000.00	— 200,000.01 - 400,000.00	
— 400,000.01 - 1,000,000.00	— 400,000.01 - 1,000,000.00	— 400,000.01 - 1,000,000.00	



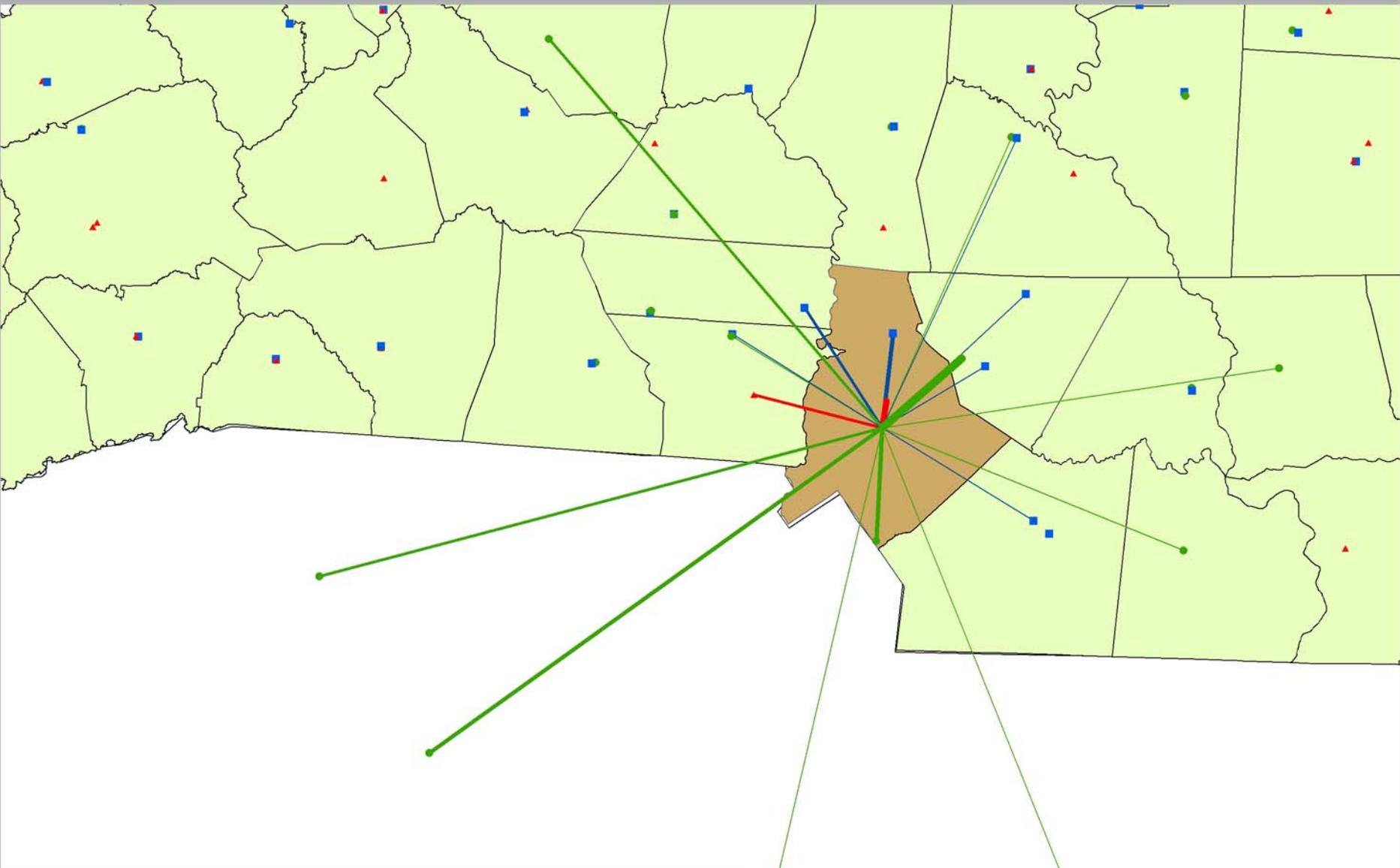
FY 06-07 Solid Waste Flow from Guilford County (tons)

CDLF	MSWLF	TRANSFER	FACILITIES
— 0 - 25,000.00	— 0 - 25,000.00	— 0 - 25,000.00	■ CDLF
— 25,000.01 - 100,000.00	— 25,000.01 - 100,000.00	— 25,000.01 - 100,000.00	● MSWLF
— 100,000.01 - 200,000.00	— 100,000.01 - 200,000.00	— 100,000.01 - 200,000.00	▲ TRANSFER
— 200,000.01 - 400,000.00	— 200,000.01 - 400,000.00	— 200,000.01 - 400,000.00	
— 400,000.01 - 1,000,000.00	— 400,000.01 - 1,000,000.00	— 400,000.01 - 1,000,000.00	



FY 06-07 Solid Waste Flow from Wake County (tons)

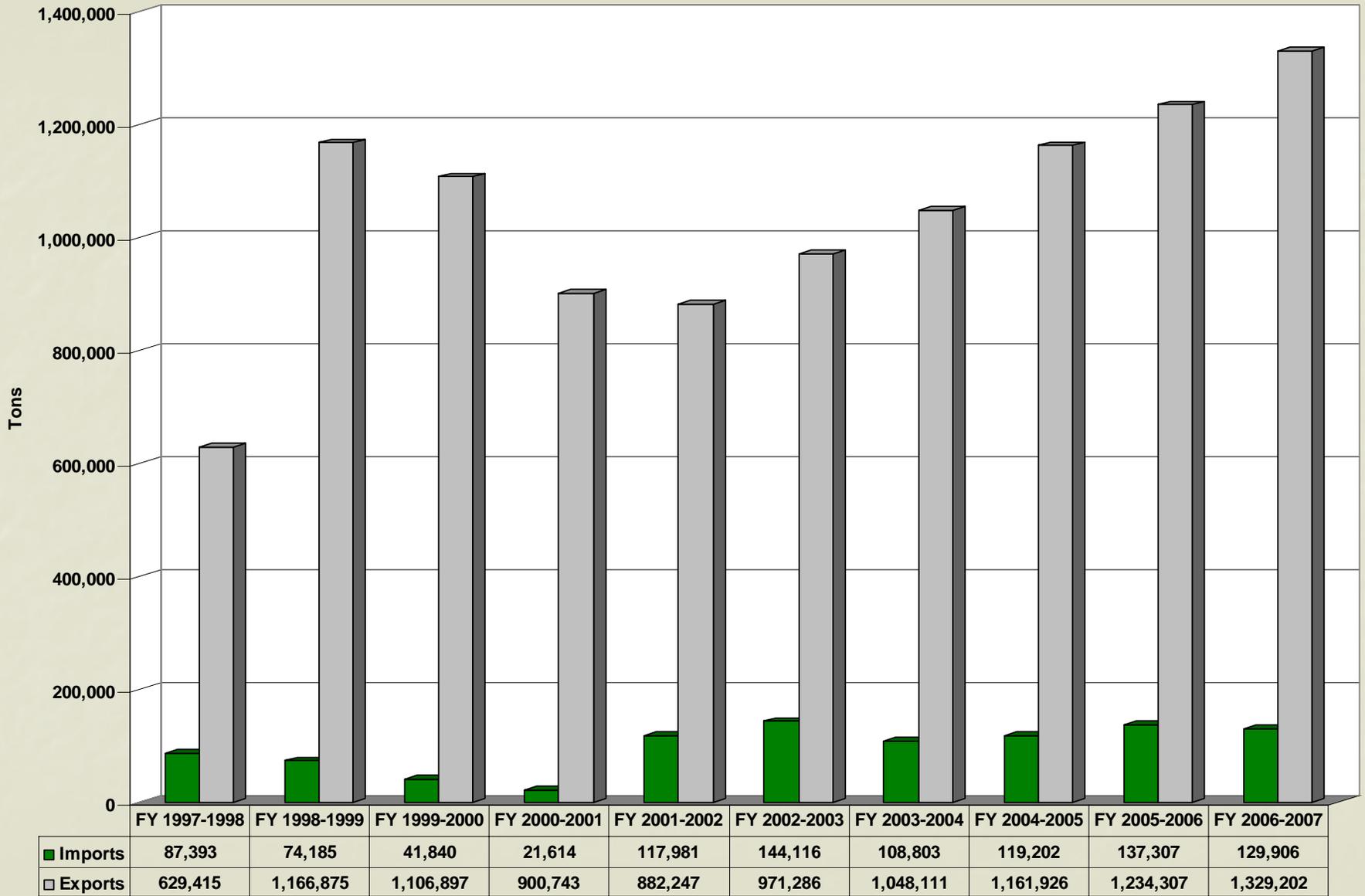
CDLF	MSWLF	TRANSFER	FACILITIES
0 - 25,000.00	0 - 25,000.00	0 - 25,000.00	CDLF
25,000.01 - 100,000.00	25,000.01 - 100,000.00	25,000.01 - 100,000.00	MSWLF
100,000.01 - 200,000.00	100,000.01 - 200,000.00	100,000.01 - 200,000.00	TRANSFER
200,000.01 - 400,000.00	200,000.01 - 400,000.00	200,000.01 - 400,000.00	
400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	



FY 06-07 Solid Waste Flow from Mecklenburg County (tons)

CDLF	MSWLF	TRANSFER	FACILITIES
0 - 25,000.00	0 - 25,000.00	0 - 25,000.00	CDLF (Blue Square)
25,000.01 - 100,000.00	25,000.01 - 100,000.00	25,000.01 - 100,000.00	MSWLF (Green Circle)
100,000.01 - 200,000.00	100,000.01 - 200,000.00	100,000.01 - 200,000.00	TRANSFER (Red Triangle)
200,000.01 - 400,000.00	200,000.01 - 400,000.00	200,000.01 - 400,000.00	
400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	400,000.01 - 1,000,000.00	

Imports / Exports



Fiscal Year

Division of Waste
Management



Solid Waste in North Carolina The Future:

**Solid Waste Management Act of 2007
*eff. 8-1-2007***

Permit Denial

1. Inconsistent with or in violation of rules
2. Violation of water quality standards
3. Damage to ecological systems, natural resources, cultural sites, recreation areas, historic sites
4. Limit or threaten access to public trust waters or public lands
5. Facility in natural hazard area

Permit Denial

6. Practical alternative exists with less adverse impacts on public resources
7. Cumulative effects of facility and other facilities in area would violate criteria 2 through 5
8. Construction and operation inconsistent with State solid waste policy, goals and plan
9. Adverse impact to minority or low-income communities (Title VI of the Federal Civil Rights Act of 1964)

Municipal Solid Waste Landfill



Design - Next Generation Landfills

- Liners and leachate collection at C&D landfills
- Dual containment of (outside) leachate pipes
- Annual cleaning and inspections of leachate collection
- Leak and damage testing for newly constructed liners
- Pipe penetration through liners is restricted
- Waste screening programs must address locally and state prohibited items
- Environmental Impact Studies for new landfills required
- Traffic studies and mitigation of adverse impacts

Location Restrictions – Next Generation Landfills

- 5 mile to National Wildlife Refuge
- 1 mile to State (Wildlife Resources Commission) Gameland
- 2 miles to State Park
- 4 feet vertical separation to groundwater and bedrock
- 200 feet to streams and wetlands
- Within areas reclaimed from 100-year floodplains and wetlands

Oversight, Review, and Procedural Matters

- Financial Responsibility required of facilities
- Environmental compliance reviews expand
- The "Owner or Operator" definition incorporates "business entity"
- Enforcement Penalties increase
- Notification to DENR of significant changes of the business entity required
- Local governments exempt from environmental impact statement requirements removed
- Landfill Liaison authorized
- Transfer of solid waste permits prohibited
- Financial Assurance minimum of \$3,000,000 for potential assessment and corrective actions (*eff. 7-1-2009*)

Landfill Gas Projects in NC

Table #1: LANDFILL GAS-TO-ENERGY PROJECTS IN NORTH CAROLINA

Facility	County	Energy Type/End Use
BFI-Charlotte Motor Speedway MSW	Cabarrus	Electricity
Buncombe Co MSW	Buncombe	Steam
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City of Greensboro MSW	Guilford	Steam
City of Raleigh MSW	Wake	Steam
City of Winston-Salem MSW	Forsyth	Electricity
Coastal Area Solid Waste Mgmt Authority MSW	Craven	Electricity
Cumberland Co. MSW	Cumberland	Steam
Henderson Co. MSW	Henderson	Steam
Iredell Co. MSW	Iredell	Electricity
Jackson County MSW Green Energy Park	Jackson	Art Center/Blacksmith
North Wake MSW	Wake	Steam
Pitt Co. MSW	Pitt	Steam
Yancey/Mitchell Co. MSW	Yancey	Greenhouse/Art Center

Future Rules

- Landfill gases
- Bioreactor landfills
- Bird and wildlife management plans
- Environmental impact minimization

Compliance

Facility Type	# Facilities	Inspections	
■ Municipal Solid Waste landfills (MSWLF)	177	2	354
■ Construction and Demolition landfills (CDLF)	86	2	172
■ Industrial landfills (INDUS)	37	2	74
■ Treatment and Processing facilities (TP)	28	2	56
■ Mixed Waste Processors (MWP)	19	2	38
■ Household Hazardous Waste facilities (HHW)	15	2	30
■ Incinerators (INCIN)	8	2	16
■ Tire Monofill landfills (TIRELF)	4	2	8
■ Tire collection /processing facilities (TIRETP)	11	1	11
■ Medical Waste facilities	5	2	0
■ Composting facilities (COMP)	52	1	52
■ Transfer facilities (TRANS)	104	2	208
■ Land Clearing and Inert Debris Landfills (LCID)	152	1	152
■ Land Clearing and Inert Debris Notified sites	731	0	0
■ Pre-Regulatory Demolition landfills (DEMO)	158	0	0
	—		—
Total	1587		1171

TYPE SOLID WASTE FACILITY	ACRONYM	NUMBER IN NC
Municipal Solid Waste Landfills	MSWLF	40
Construction and Demolition Landfills	CDLF	68
Industrial Landfills	IND	16
Land Clearing and inert Debris Landfills	LCID	116
Land Clearing and Inert Debris Notification Site	LCIDN	700
Transfer Stations	TRANS	84
Tire Monofills/Processing	TIRE	5
Incinerators	INC	6
Solid Waste Compost Facilities	SWC	44
Treatment and Processing-Yard Waste or Land Clearing Debris	TP-YW or TP-LCD	9
Treatment and Processing Land Clearing Debris Notification	T&PN	50
Treatment and Processing – Other	T&P	33
Septage Land Application Sites	SLAS	527
Yard Waste Notification Site	YWN	131
Closed Landfills which require Inspection	CLOSED	211
	TOTAL	2040

Fees and Taxes

- Permitting Fees for applications
- Annual Fees at permitted facilities (*8-1-2008*)
- Solid Waste Disposal Tax of \$2.00 per ton at Landfills and Transfer Stations going Out-of-State (*eff. 7-1-2008*)
 - 50% to Inactive Haz Site Cleanup Fund
 - 18.75% Cities per capita basis
 - 18.75% Counties per capita basis
 - 12% to the Solid Waste Mgmt Trust Fund

Discarded Computer Equipment Management *(1-1-2009)*

- Manufacturer Registration and \$10,000 fee (future annual fees are \$1000)
- All computer equipment must be labeled
- Manufacturer's Plans due to NCDENR
- NCDENR maintains list of computer manufacturers
- NCDENR provides recycling education to public
- NCDENR provides enforcement of law

Discarded Computer Equipment Management

- State agencies buying prohibitions in place *(7-1-09)*
- Manufacturer plans effective *(10-1-2009)*
- Collectors ensure proper storage *(1-1-2010)*
- Manufacturer's Annual Report *(2-1-2011)*
- NCDENR Annual Report *(4-1-2011)*
- Disposal Prohibited in Landfills or Incinerators *(1-1-2012)*

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Solid Waste Section

Division of Waste Management

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